SUSQI PROJECT REPORT

Reducing Food Waste on Holcot Ward

Start date of Project: 24th September 2024
Date of Report: 13th March 2025

Team Members:

- Trena Lee, Ward Sister Holcot Ward
- Martin Baldwin, Catering Services Manager

Background:

Food waste is a significant issue within the NHS. Research from the with Campaign for Better Hospital Food estimates more than 30 million NHS patient meals are thrown away each year with each hospital Trust wasting an average of 190,994 patient meals each year. In NGH food waste has been a concern for several years and detailed monitoring of plate waste, as well as review of the total tonnage of waste disposed of via anaerobic digestion has been ongoing. In 2023/24, 39,649 meals were returned uneaten from inpatient wards, from a total of 628,061 served (6.3%).

It is estimated that food and catering services in the NHS produce 1,543 ktCO2e each year, equating to approximately 6% of total emissions. The production, transportation, storage, preparation, and disposal of food all generate greenhouse gas (GHG) emissions, and when meals go uneaten, these emissions become wasted. Additional environmental harm is also caused through the need to dispose of food waste.

Food waste represents a direct financial loss to the NHS. Preparing meals that are not consumed leads to inefficient use of already constrained resources. Additionally, the cost of disposing of uneaten food adds to the financial burden, diverting funds that could be better allocated elsewhere.

Using Model Hospital data for the year 2023/24, the average cost of meals was £5.39, of which £1.53 was the cost of the ingredients, the rest being made up of staffing costs. This means that the cost of the full meals returned to the Trust kitchen was £213,708, with ingredient costs to make these meals of £60,663. The food from inpatient meals is sent for anaerobic digestion; 93.8 tonnes were sent in 2023/24 from the patient areas as well as the Trust's kitchen and restaurant at an additional cost of nearly £9,000.

Food waste can directly affect patient outcomes, as it often reflects inadequate oral intake and nutrition. Malnutrition is particularly concerning among elderly patients, who may already be vulnerable due to chronic conditions or frailty. Poor nutrition can lead to slower recovery times,

increased susceptibility to infections, and longer hospital stays, further straining the healthcare system. Ensuring proper nutrition is crucial for promoting recovery and maintaining overall health.

Food waste is particularly pronounced on elderly wards, where patients often face prolonged stays. These patients may have low appetite, dietary or other restrictions (e.g. fasting for a test), or difficulties with eating and drinking due to poor physical or cognitive health. Furthermore, long hospital stays can lead to reduced interest in eating, especially as hospital menus may not change regularly.

Holcot Ward was identified as the ward that sent back the largest number of untouched meals each month and was consistently sending back 100-150 meals each week out of approximately 420 that were served. This was a return of between 20% to 40% of meals and was around twice as high as any other inpatient ward. Holcot ward is located in the Centre for Elderly Medicine and has 30 beds for elderly and frail patients. A significant proportion of the patients are on the ward for weeks, if not months, and therefore there is a degree of menu fatigue.

Data gathered for a number of years shows reasons meals are sent back:

- Patient did not like the meal
- Patient had no appetite
- Patient was too ill to eat
- The wrong meal was sent
- The dietary requirements did not match the meal
- Patient was asleep
- Patient was off the ward (usually for tests or physiotherapy)
- Patient was deceased
- Patient was designated Nil By Mouth
- Patient was discharged
- Patient was transferred
- Too many meals were ordered for the ward.

Specific Aims:

To reduce food waste, particularly full meals, in a care of the elderly ward at Northampton General Hospital (NGH).

Methods:

Studying the system

All food at NGH is cooked on site by the Catering Team and frozen. Meals are plated in the Barratt Kitchen and then regenerated using steam and delivered to the wards. There is a seven-day menu cycle with meat, vegetarian and cultural options available. Food is ordered on a day before basis through paper menus and served through a dedicated Hostess service by the Catering Team. Lunch is served at approximately 12 noon, and dinner at 4:30pm.

From the data obtained in the last two years, the main reasons for the full meals being returned are that the patient had no appetite or did not like the meal, which accounted for more than 80% of the

returned meals most weeks. The patient being asleep was the next biggest reason for the return of the meals. There does not seem to be any correlation between days of the week and the amount of food (in terms of weight) or full meals being returned. There was no data available prior to the Green Team competition as to whether there were any specific days that showed a higher amount of food waste, but given the length of stay this is less likely to be seen in Holcot Ward where fewer patients are discharged each week.

The Catering Team introduced finger food boxes to the options for patients on Holcot Ward, but there had been some logistical issues with this, and there is no data available to show whether this had impacted food waste. However, given that plate waste had not been seen to reduce, it is assumed that the impact was minimal.

Staff on the ward felt that there was a degree of menu fatigue for the patients, particularly as they have a lot of long stay patients, and that many of the options on offer were not what the patient demographic are likely to eat. The occasional Fish and Chip Friday, when small portions of fish and chips were brought directly from the Hospital Restaurant, were popular, but not deemed a regular option by the Catering Team and the impact on patient waste was not measurable.

There is an option of smaller portions on the menu via a tick box which was implemented to reduce the potential for food waste, but there is no data available in NGH with regards to the mix of small and standard sized portions. For example, a Healthcare Without Harm report showed that food waste had been reduced in Hvidovre Hospital by making small portions the default option whilst allowing a patient to order a double portion if they want more. The small portions at NGH however, are only slightly smaller due to the requirement to regenerate without adversely impacting on the appearance or taste of the food.

A previous trial (2016) that had a bulk feeding option whereby the food was served on the ward showed a reduction in the amount of food waste from a 27-bed elderly ward of 14 meals per day, with smaller portions served (the equivalent of only 22 full sized portions) and patients seen to be eating more food.

Implementing change

Several ideas were implemented during the competition weeks:

- Blue plates: Blue plates help pale foods like mashed potatoes and porridge stand out, making them more appetising, especially for patients with visual impairments or dementia. This simple change supports patient nutrition while reducing food waste. Trials at four other NHS Trusts have shown a reduction of between 14% and 29% of food waste. Solent Community Hospitals saw a 20.6% decrease in plate waste and a 14% increase in the number of empty plates in an 8 week trial.
- Cakes in afternoon instead of desert with lunch: This reduced the amount of food given at one time and shortened breaks between food offered as per patient comments
- Plan to trial bulk service (as evidenced in 2016 by an internal NGH trial, this could reduce the food waste, particularly by reducing portion size)
- Ensure smaller portions are ordered where appropriate

Samples of blue plates were obtained prior to ordering. Issues with the ability to regenerate food on the new plates did arise as they are slightly smaller than the existing white plates.

Blue plates were ordered for all areas across the Trust. The financial investment was £14,238 for the Trust or £474.60 for one ward. This investment was based on expected Trust reductions in food waste of a minimum of 10%, which based on Model Hospital costs would be £6,000 in ingredients or £21,000 if staff time was also considered, plus the cost of the electricity for the preparation. This investment was agreed by the Director of Facilities on an invest to save basis; this is where the budget sits for catering. The plates were introduced across the Trust on the 11th November.

The trial of cakes in the afternoon was not successful, and most were not eaten by the patients.

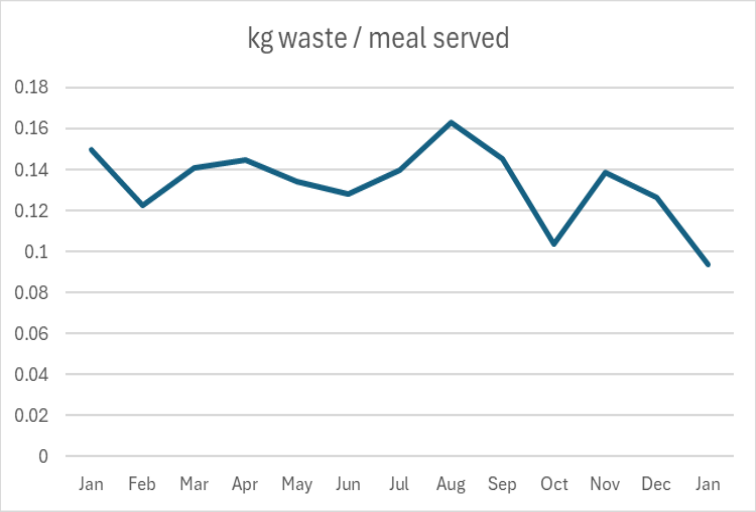
Measurement and results:

Patient outcomes:

We have not collected data however there is potential that reduced food waste could mean patients are eating more, which may improve nutrition. This would need to be monitored however as food waste could also be due to less food being provided (e.g. from smaller portions).

Whilst there is no direct evidence that patients are eating more food, the data collected on the plate waste indicates that this is the case. The total number of full patient meals returned uneaten reduced dramatically from the start of the trial period. This implies that patients are eating more food, even if it is only a small amount. For patients that do not have a meal, there is a missed meal service, but there is no evidence that there has been a change in the frequency of meals ordered this way; the total number of meals has shown no particular pattern.

The weight of food returned has also reduced, which could be linked to smaller portions being ordered as shown in the Graph below.



Environmental sustainability:
There are two ways of measuring the reduction in environmental impact from food waste - either in terms of the reduction in the cost of the ingredients using Defra SIC related ghg conversion factors, or using the weight difference and the DESNEZ emission factors for food production and waste disposal via anaerobic digestion. Both are presented here.

Items that are not included are the emissions related to the transport of the food or the cooking of the food, as these are not available.

Conversion factors (DESNEZ) (2024):

- Anaerobic digestion – 8.8836 kg/tonne
- Primary material production 3701.40359 kg/tonne
- DEFRA SIC 2021 GHG emission factor: Other food products 0.725 kgCO2e/£

	kgCO2e emissions using DESNEZ weight conversion factors per month	**kgCO2e emissions using weight and DEFRA factors (ingredients)**	**kgCO2e emissions using weight and DEFRA factors (whole cost)**
October 2023 - September 2024	956.6	817.1	2878.5
October 2024 - January 2025	819.5	700.0	2466.1
Difference	137.1	117.1	412.4
Annual Projected Saving	1644.6	1404.8	4949.0

As the DESNEZ factors are more up to date and include production and disposal figures, this would seem to be the more reasonable figure to be using. Projected across a year, this is an annual saving

of 1,645 kgCO2e in food production and disposal. This is equivalent to driving 4,847 miles in an average car.

Despite the implementation of an improvement project that has not progressed in the way we expected, we have observed a reduction in food waste during the project period. While the specific reasons for this decrease are currently unclear, we recognise the possibility that it may be influenced by factors such as changes in the patient population, random variation, or other coincidences not directly linked to our interventions.

To better understand this trend, we will continue to monitor food waste data over time while continuing to explore and implement further strategies to sustain and enhance this reduction.

Economic sustainability:

Financial data was obtained from ERIC returns entered by the catering team for the year 2023/24. These included the cost of ingredients, but also the total cost including the staff costs. This does not include the cost of energy to produce the meals. To even out any fluctuations in the data, the average for each week was taken for the year up to the start of the project and then for the period October to January during the project. The whole meals returned from Holcot and the cost of these are shown below:

	Average number of meals returned per week	**Average cost of ingredients for returned meals per week**	**Average cost of meal for returned meals per week**
October 2023 – September 2024	114	£174.54	£614.88
October 2024- January 2025	39	£59.67	£210.21
Difference	75	£114.87	£404.67
Annual Saving Projected	**3,904**	**£5,973.24**	**£21,042.98**

However, it is not necessarily the case that the reduction in completely uneaten meals means a corresponding reduction in food waste; only part of the meal might have been eaten. Using the data gathered per month for the food returned to the kitchens, including part eaten food, and assuming a meal weight of 350g, the following financial costs have been calculated for Holcot ward (although the method of measurement changed just before the project started).

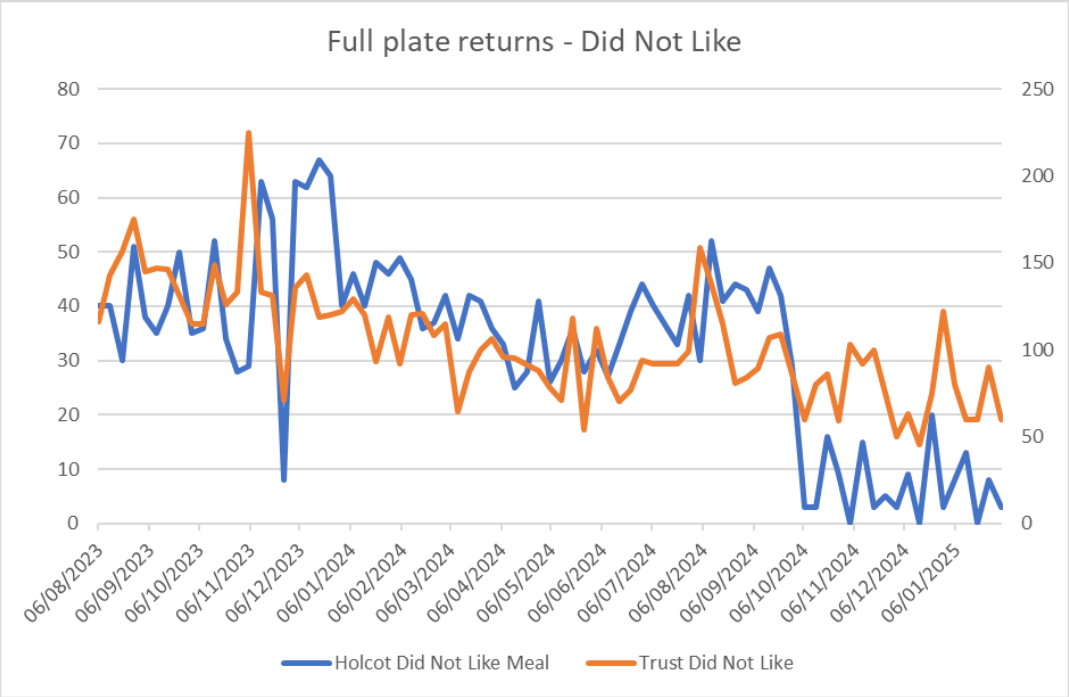
	Average weight returned (kg) per month	**Equivalent meals per month**	**Average cost of ingredients per month**	**Average cost of meals per month**
October 2023 – September 2024	257.8	736.6	£1127.01	£3970.33

October 2024-January 2025	220.9	631.1	£965.54	£3401.38
Difference	36.9	105.5	£161.47	£568.85
Annual Saving Projected	**443.2**	**1266**	**£1937.67**	**£6826.20**

Projected across a year, assuming the reduction in waste is maintained and accounting for cost of the blue plates (£474.60), the financial saving from the project is £6,351.60 using the lower figure for the food waste savings based on the weight returned.

We will continue to monitor the food waste from the ward level and calculate the potential savings. We will also look at whether the same changes have been seen in other wards with longer staying or elderly patients, as the blue plates have been implemented Trust wide. This will be included in internal reporting.

Social sustainability:
An improvement in the figures for meals returned because the patient did not like the meal, that has not been reflected to the same extent across the trust, also shows a positive social impact as there is an improvement in morale of patients if they are given a meal that they enjoy eating.



Reducing food waste is likely to be supportive for staff morale and job satisfaction. Staff on the wards may feel positive that patients are eating more, and catering staff may have reduced frustration of seeing so many meals they have taken time to prepare being returned.

Discussion:

Since the start of the project there has been a substantial reduction in full meals sent back to the kitchen untouched, with the number reducing by 66%; the meals returned as a percentage of meals that were served reduced from 27.2% to 8.6%. There has been a smaller reduction in the weight of food returned as waste. The reduction in the weight sent back, which includes partially eaten food, was 14.3%. This has been sustained past the end of January.

The reasons for this could be attributed to a number of factors; change in patient demographic (there had been an increase in food returned due to discharged patients, but also a reduction in the number of patients that were asleep and missed their meal), the introduction of blue plates (although a reduction was seen prior to the introduction of the plates), a move to smaller portions, or even a change in staff on the ward. (It was noted that there had been no change in menu during the competition period). This is not a trend that has been reflected more widely across the Trust.

There were two major limitations to the project. Firstly, was the inability of the catering staff to provide a different menu or method of providing the food, e.g. bulk serving or different menus deemed more suitable for the demographic of the patients. Some of the ability to make changes was a result of a delay in the delivery of electronic meal ordering which should reduce waste as food will be ordered on the same day, rather than the day before.

The second was the collection of data. Although the number of full meals returned is considerably reduced, the weight of the food being returned to the kitchen does not reflect as big a change. However, at the same time as the start of the project the catering team changed the way that the food waste was measured by implementing Lean Path.
Although there has been a dramatic change in the full meals returned, the likely impact on food waste costs is less than calculated based on full meals. This is reflected in the lower reduction in the waste returned each month. A further complication arises as the number of meals served is based on four or five week cycles, whereas the waste from October 2025 is based on a calendar month, which makes this only an approximation of waste per meal served.

However, even given this limitation it is clear that there has been a sustained reduction in food waste from Holcot ward, even when compared to all the inpatient wards which has reduced financial and environmental cost and increased the amount of food patients have eaten.

Conclusions:

Despite the difference in the results seen from a returned meals perspective compared with a returned weight perspective, there has still been a reduction in the food waste sent back from Holcot Ward which has now gone from sending back between 20 and 40% of meals completely untouched, to less than 10%. Some of this is likely to be as a result of the staff encouraging the ordering of smaller meals, and some to the introduction of blue plates.

The key learning from the work is to determine the data to be collected and to be consistent, and to get more engagement from the catering staff as ward staff feel powerless to make the changes they feel are necessary to increase the amount of food that the patient is eating.

It also has highlighted that, despite collecting the data, change will not happen unless the teams are working together and engaged. The provision of the cakes did not make a difference, but this may have been because of the quality of the cakes, rather than the idea. Bulk feeding was not attempted, even though staff were engaged and it had been shown to make a difference in the past on an elderly medicine ward. The fact that the full meals returned has reduced means that patients who, in the past, may not have had anything to eat, have at least had something. The Trust has recently gained the addition of a dietician who is in the Trust 2 days per week and who will be looking at the impact of food waste as part of her work.

Critical success factors

Please select one or two of the below factors that you believe were most essential to ensure the success of your project changes.

People	Process	Resources	Context
☐ Patient involvement and/or appropriate information for patients - to raise awareness and understanding of intervention **X Staff engagement** ☐ MDT / Cross-department communication ☐ Skills and capability of staff ☐ Team/service agreement that there is a problem and changes are suitable to trial (Knowledge and understanding of the issue) ☐ Support from senior organisational or system leaders	☐ clear guidance / evidence / policy to support the intervention. ☐ Incentivisation of the strategy – e.g., QOF in general practice ☐ systematic and coordinated approach ☐ clear, measurable targets ☐ long-term strategy for sustaining and embedding change developed in planning phase ☐ integrating the intervention into the natural workflow, team functions, technology systems, and incentive structures of the team/service/organisation	☐ Dedicated time ☐ QI training / information resources and organisation process / support ☐ Infrastructure capable of providing teams with information, data and equipment needed ☐ Research / evidence of change successfully implemented elsewhere ☐ Financial investment	☐ aims aligned with wider service, organisational or system goals. **X Links to patient benefits / clinical outcomes** ☐ Links to staff benefits ☐ 'Permission' given through the organisational context, capacity and positive change culture.